REMARKS

Claims 1-20 are pending. Claims 4, 5 and 9-16 have been amended. Claims 17-20 have been newly added. The specification has been amended. The abstract has been replaced with a new abstract. The title of the invention has been replaced with a new title. No new matter is presented.

The abstract was objected to for language and format. The abstract has been replaced. Withdrawal of this objection is respectfully requested.

The title was objected to for not being descriptive. The title has been amended. Withdrawal of this objection is respectfully requested.

Claims 5, 6, 13-16 were objected to as being in improper form. This objection has been overcome by the foregoing claim amendments. Withdrawal of this objection is respectfully requested.

Claims 9 and 10 were rejected under 35 USC 102(e) as being anticipated by Kobayashi, U.S. Patent 6,750,911. This rejection is respectfully traversed.

Claims 9 and 10 have been amended to depend from claim 11. Their patentability will be discussed below in conjunction with the discussion of claim 11.

Claims 1-3, 4/1, 4/2, 4/3 and 7 were rejected under 35 USC 103(a) as being unpatentable over Udagawa, U.S. Patent 5,880,781. This rejection is respectfully traversed.

Claim 1 recites "while retaining the signal charges of specific pixels of those read in the previous step mentioned above by maintaining said specific pixels in the read-out state, transferring the other signal charges read in said previous step so as to add the transferred signal charges to the retained signal charges." Claim 7 recites substantially the same step. The devices of claims 1 and 7, call for transferring charges of other pixels, while maintaining charges of specific pixels in the read-out state, so as to add the charges of the aforementioned other pixels to the charges of specific pixels. The prior art does not teach or suggest this feature.

In the Action beginning at pg. 5, line 19, the Examiner refers to Figures 2A, 2B, 2C, and 2D and states that Udagawa teaches the above-mentioned features. Applicants respectfully disagree.

In order to clarify the differences between the claimed device and the device disclosed in Udagawa, Applicants offer the attached drawings for illustrative purposes only. The attached Fig. 1 corresponds to FIGS. 2A, 2B, 2C, and 2D of Udagawa and represents the state which corresponds to the state of potentials shown in FIG. 24 of the present application. FIG. 24 of the present application is reproduced in the attached Fig. 2, along with additional notes, again for illustrative purposes.

The device of Udagawa will first be described in conjunction with attached FIG. 1. As seen therein, FIG. 2A of Udagawa shows the state of potentials of a vertical transfer path prior to charge readout. Next, in FIG. 2B, high-voltage charge readout pulses (la,lb) are applied to gates V1,V3 so that M1, C1, C3, and G3 alone are read out and transferred to a V-CCD.

Then, in FIG. 2C, after the aforementioned application of the readout pulses is stopped, another high-voltage pulse (3) is applied to the substrate, and Y2, G2, Y3, and M3 carriers are discharged to the substrate, so that Y2, G2, Y3, and M3 carriers, which are not read out as they are not needed, are discharged to the substrate.

Next, in FIG. 2D, a positive voltage is applied to the gates V2 so as to eliminate a barrier to the potential between M1 and C1, as well as a barrier to the potential between C3 and G3, so that summation of the signal charges is enabled. As a result, sum carriers M1+C1 and C3+G3 are generated and transferred towards a horizontal transfer path.

As described above, while it is true that, according to Udagawa, summation of pixels is performed in the process shown in FIGS. 2A to 2D, it is clearly evident that the process described in Udagawa is different from the aforementioned feature of Claims 1 and 7, which calls for

transferring charges of other pixels, while maintaining charges of specific pixels in the read-out state, so as to add the charges of the aforementioned other pixels to the charges of specific pixels.

The "read-out state" mentioned in the foregoing paragraph refers to a state where high-voltage VH charge readout pulses (la, lb) are applied to specific pixels as shown in FIG. 2B of Fig. 1. The "read-out state" does not refer to a state shown in FIG. 2C, where charges are merely present on a vertical transfer path.

It is also evident that, when charge readout pulses (la, lb) are applied to specific pixels in FIG. 2B of Fig. 1, in other words when the system is in the "read-out state" (represented by broken lines 2), transfer of other pixels is not performed.

Taking a hypothetical case in which pulses VHH having a voltage higher than that of charge readout pulses VH are applied while the system of Udagawa is maintained in the "read-out state" shown in FIG. 2B, the charges of M1, C1, C3, and G3 carriers, which have been read and transferred to the V-CCD, are partly or entirely discharged to the substrate, resulting in failure of the system to function as an image sensor. In other words, at the stage shown in FIG. 2C, during which application of the readout pulses (la and lb) is stopped, the system is no longer in the "read-out state."

As described above, it is evident that Udagawa does disclose "transferring charges of other pixels, while maintaining charges of specific pixels in the read-out state, so as to add the charges of the aforementioned other pixels to the charges of specific pixels."

However, as shown in the attached Fig. 2 (Fig. 24 of the present application), according to the claimed invention, readout pulses are applied to V3A and V3B in state B so that R0-R10 are read out to a vertical transfer path. Next, in state C, the charge readout pulse applied to V3B is stopped. However, the application of charge readout pulse to V3A continues so that the "read-out state" is maintained as represented by broken lines 2. Then, as represented by broken lines 1, pixels are transferred, and their charges are summed in states from C to I.

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A benefit of the claimed invention lies in that the number of pixels to be summed up can be increased without having to increase the number of vertical transfer electrode systems. Udagawa requires eight electrode systems V1-V8, as well as an external device to drive these electrodes, even for 2-pixel summation, which involves simple omission. As shown in the attached Fig. 2, even though the driving method is very effective in that it enables summation of a plurality of pixels of a like color, the invention under the present application requires only six electrode systems, in other words, a fewer number of electrode systems than required by Udagawa. The invention under the present application is superior also to Kobayashi because the configuration of electrode systems can be made simpler than that of the system of Kobayashi even for performing summation of numerous pixels of a like color.

As described above, the invention under the present application teaches a concrete structure, as well as its operation, that enables summation of a plurality of pixels through summation of pixels of a like color or color-mixing summation and also enables summation of an increased number of pixels without increasing the number of electrodes or making redundant external driving means, which would otherwise be inevitable due to increase of the number of electrodes and result in an increase in production costs. Accordingly, the features of claims 1 and 7 are not taught or suggested by the cited art, either alone or in combination.

Claim 2 recites forward or reverse transfer of charges that have been read out, wherein the transfer is performed on the first transfer paths. On the other hand, Udagawa relates to readout from pixels rather than transfer performed on a transfer path. Udagawa fails to teach or suggest performing forward or reverse transfer on the first transfer paths.

The remaining claims are allowable at least due to their respective dependencies. Applicants request that this rejection be withdrawn.

Claim 8 was rejected under 35 USC 103(a) as being unpatentable over Udagawa, in view of Kobayashi and further in view of Yu, U.S. Patent 6,034,366. This rejection is respectfully traversed.

Claim 8 recites an apparatus that includes a processing means for reversing the order of summed output from a solid-state image pickup device. On the other hand, Yu relates to a solid state image pickup device itself and does not disclose or suggest a processing means for reversing the order of summed output from the solid-state image pickup device. Accordingly, the features of claim 8 are not taught or suggested by the cited art, either alone or in combination. The remaining claims are allowable at least due to their respective dependencies. Applicants request that this rejection be withdrawn.

Claims 11, 12/9, 12/10 and 12/11 were rejected under 35 USC 103(a) as being unpatentable over Kobayashi in view of Udagawa. This rejection is respectfully traversed.

Claim 11 recites an apparatus that is capable of switching modes during preliminary measurements, and obtaining effective data for the main shooting by performing preliminary measurements in the mode to which the apparatus has been switched. On the other hand, the system described in the Udagawa calls for switching main shooting modes based on the result of preliminary measurements. Thus, the features of claim 11 are not taught or suggested by the cited references, either alone or in combination.

Claims 9, 10 and 12-16 are allowable at least due to their dependency from claim 11. Applicants request that this rejection be withdrawn.

Newly added claims 17-20 correspond to claims 13/9, 14/9, 15/9 and 16/9, respectively. None of the cited references teach or suggest the features of claims 17-20.

In view of the above, each of the presently pending claims in this application is believed to be in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to withdraw the outstanding rejection of the claims and to pass this application to issue. If it is determined that a telephone conference would expedite the prosecution of this application, the Examiner is invited to telephone the undersigned at the number given below.

In the event the U.S. Patent and Trademark office determines that an extension and/or other relief is required, applicant petitions for any required relief including extensions of time and authorizes the Commissioner to charge the cost of such petitions and/or other fees due in connection with the filing of this document to Deposit Account No. 03-1952 referencing docket no. 524642000500.

Dated: June 14, 2005   Respectfully submitted,

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Attachment: Example Figs. 1 and 2